The
VETERINARY RECORD
Founded by William Hunting, F.R.C.V.S., in 1888
7, MANSFIELD STREET, PORTLAND PLACE, LONDON, W.1. MUSEUM 6541
No. 16 APRIL 21st, 1956 Vol. 68
Registered for Transmission as a Newspaper *Price 2s. post free*

Forum: The Treatment of Canine Virus Diseases

Members of the Forum

Rosemary Welch (Rickmansworth). **J. K. Bateman** (Potters Bar). **W. B. Martin** (University of Glasgow Veterinary School). **W. B. Singleton** (Animal Health Trust, Kennett). **C. E. Woodrow** (Knightsbridge, London).

Dr. F. R. Bell was in the chair.

Question 1

What measures may be taken to avoid the encephalitic symptoms of distemper?

Mr. Woodrow: I think that this question of the nervous complications of distemper is perhaps the most important and certainly the most difficult that we have to deal with in practice. With the range of broad spectrum antibiotics available to-day, we rarely lose a case of distemper—and here when I refer to distemper I include all the distemper complex, whether we call it Laidlaw-Dunkin, hard pad disease, type A, B or C, but excluding canine virus hepatitis. In fact, the actual mortality is not high, the high rate of loss being due to the number of dogs which we have to destroy, because of our inability, in the light of our present knowledge, to prevent the onset of nervous complications.

Encephalitis seems to show itself in two forms; firstly, in the case where nervous symptoms arise early in the course of the disease and appear to be due to direct damage to nerve cells by the neurotropic virus. Such cases fortunately are rare and are usually fulminating and fatal. But the second form is the more common and may well be different in aetiology. It is insidious in onset and does not appear until the third or fourth week of the disease. This type of case usually occurs as follows. The early febrile stage has passed and with it the tonsillitis; catarrhal symptoms have responded to antibiotics, the persistent diarrhoea has cleared up with, say, sulphadimidine, but the scleral congestion persists, with anorexia and a grumbling temperature around 103°. The first danger signs to the experienced observer are what I can only describe as a worried look or frown, as though the dog had a headache. Then comes what, to the owner, appears to be the favourable turning point: the dog has started to eat again, he says, ravenously—the immediate danger signal of bulimia. Then in rapid succession follow mouthing fits, circling, inco-ordination, altered disposition, certain neurodermatoses affecting mostly the ears and tail, and epileptiform convulsions. At this stage we are usually forced to destroy the dog through lack of any isolation hospital facilities and the exhaustion and lack of hope of the owner.

Research workers tell us that all this is due to a process of demyelination of the nerve cells and fibres in the brain. It is a slow process and probably starts and continues from the beginning of the infection. If we thought of modern distemper as a demyelinating encephalitis and not in terms of a catarrhal infection with possible mental complications later we should, I think, appreciate that we ought to be treating the demyelinating process right from the outset, before it becomes apparent. The clinical picture certainly gives support to the view that this myelin absorption is due rather to toxic substances released from cells destroyed by the virus or to the action of some antibodies produced by the dog, than to any direct action of the virus itself. Hence the slowness of onset and the frequent appearance of nervous symptoms some time after apparent recovery.

It will give us a clearer picture of the development and progress of the encephalitis if we think of it in electrical terms. The brain is like some vast automatic telephone exchange with many thousands of interlocking circuits. The smooth functioning of such a system depends on many factors, two of which are analogous to the workings of the brain. Firstly it must be supplied with the correct potential of electricity, and secondly the insulation between adjacent circuits must be maintained. Now two things happen during the development of encephalitis: the voltage

The Forum was heard at a meeting of the Central Veterinary Society, held at the Royal Veterinary College on October 6th, 1955.

rises, and at the same time the insulation of the nerve cells and fibres is slowly lowered by the demyelinating process. Finally comes the stage where the insulation resistance breaks down, short circuits occur and—almost literally—sparking across from one circuit to another occurs with all the convulsive movements so caused.

Treatment

This can also follow the electrical analogy. We cannot restore the insulation of the damaged circuits, and all we can do is try and lower the voltage to a point where short circuits and sparking cease to occur. The classical treatment is with some form of barbiturate, of which probably phenobarbitone or phemitone is the choice. But often we find we have to continue so long, and with such high dosage, that we are left with a dog that is a nervous and physical wreck, both from the phenobarbitone and from the cerebral depression. Then we can only turn off the current altogether by destruction. It is here that the anti-convulsant drug primidone* has been of such great value. In some strange and unexplained manner it is capable of lowering these high voltages, probably by making the nerve trunks more conducting, without any attendant depression of mental or physical functions. It should be employed early in the disease—as early as a diagnosis can be made—to avoid the build-up of these destructive potentials.

Prevention

1. Firstly we should try to ensure as far as we can that there are the very minimum of susceptible dogs in our practice area, by the constant recommendation and use of egg-adapted virus.

2. If we are fortunate to see the distemper case early, we should try to neutralise all free virus in the circulation and tissue fluids by adequate doses of hyper-immune serum.

3. A treatment of great promise, which unfortunately is not at the moment available, was the use, even in later stages of the disease, of therapeutic virus. There is no time to recall this treatment more fully, and I will only quote some figures taken by the Wellcome Laboratories as a result of the census forms issued at that time with each dose of therapeutic virus. Of the cases treated and reported, one-third developed nervous symptoms, but of these 59 per cent. recovered.

4. No antibiotic at present available will have any effect on the demyelinating process.

5. I think that rest and avoidance of excitement are just as important as they are with poliomyelitis in man. I myself do not believe that diet is an important factor in any way, although I know there are many who will disagree. I always feel it is more important to keep the dog as strong and contented as possible throughout the whole course of the disease, by giving him whatever he fancies and as much as he will eat voluntarily.

6. The use of primidone from the outset does seem to reduce the incidence of apparent encephalitis. While preventing the build-up of excessive voltages, we must try to prevent the absorption of myelin from the nerve sheaths and maintain their insulation. I believe it has been demonstrated in laboratory animals that salicylic acid will protect nerve cells from demyelination. This may be the explanation for the popular use of aspirin, phenacetin and codeine mixture some years ago; it was found empirically to be helpful. Unfortunately a dog will not stomach the large doses required, probably of the order of 10 grains of aspirin or its equivalent three times a day. This inevitably produces vomition. In conclusion I can only offer some suggestions. For the last two years now, when I have wanted to develop such a line of treatment, distemper has virtually disappeared from Central London. With only a few cases, therefore, one cannot dogmatise and I can only say that my limited experience indicates that the regular employment of the more soluble or less irritating forms of salicylates have reduced the incidence of encephalitis.

* Mysoline.

Mr. Singleton said he agreed with much of what Mr. Woodrow had said; it was difficult to find any point upon which he disagreed. He confirmed the use of primidone, and of starting the drug in the early stages, almost as soon as the diagnosis was made. The drug should be used carefully, and the dosage increased over three or four days until the full recommended dose of 25 mg. per 10 lb. bodyweight was reached. It could be maintained if necessary for eight to ten weeks. He agreed that it seemed to diminish the manifestation of nervous symptoms.

Miss Welch said that when she had used primidone she had been pleased with the result. She had never used it at the outset, though obviously that was worth considering; in some cases where nervous symptoms were imminent it had apparently prevented them from developing. Had Mr. Woodrow found it absolutely useless in the old, recovered dog, which had fits every month or so but was otherwise normal?

Mr. Woodrow said it was a question of knowing when to start, as primidone was an expensive drug; in the old-established type of case the cheapest form of treatment was phemitone.

Mr. Martin said he was in agreement with much that had been said, in particular that it was important to rest the dog and that diet did not appear to make much difference to recovery from the disease. He had insufficient experience of primidone, having never used it in the initial stages. In cases showing nervous signs he had been rather disappointed. He was surprised about the disappearance of distemper from Central London as he saw a lot of it in Glasgow.

Mr. Bateman said he would like to know if Mr. Woodrow was quite definite that the virus did enter the central nervous system and was responsible for the damage there. Did he not think that the actual pressure inside the spinal column was responsible for some of the symptoms? Concerning diet, he felt it was possible that certain minerals might help protect the central nervous system. They should not discard diet as useless without due cause. He doubted whether enough attention was paid to mineral requirements.

Question 2

Of what value are the currently used therapeutic agents in the treatment of canine virus diseases?

Mr. Martin said he would deal with the value of some therapeutic agents in the treatment of distemper before discussing the therapy of Rubarth's disease. Under the term "distemper" he included cases which failed to show hyperkeratosis of pads or nose, as well as those dogs which at some stage during the illness developed macroscopic hyperkeratosis or changes which could only be recognised histologically.

In the Glasgow Veterinary School they held the view that distemper and the so-called "hard pad disease" could not be differentiated on clinical or pathological grounds. He thought it was difficult to assess the value of drugs in distemper because they had no readily available method of confirming their diagnosis in the live animal. They were dependent merely on clinical signs. In the early stages, therefore, it was difficult to be certain of one's diagnosis and often it was necessary to wait until the clinical signs were established before administering any specific treatment. He was speaking on individual cases; some of the difficulties might be overcome in dealing with an outbreak in kennels.

He felt sure that everyone saw cases which showed signs closely resembling the early stages of distemper and which recovered quickly with or without treatment. These dogs at some later date again became ill, and developed signs and ran a course quite characteristic of distemper. Sometimes these dogs ended up with encephalitis or had to be destroyed, with confirmation of the diagnosis obtained at autopsy examination. If a special drug had been used in the initial illness then a false result would have been obtained and in order to avoid this source of error, they had tended to wait until fairly confident of their diagnosis before attempting treatment. Even so, in many cases the treatment was initiated quite early in the course of the disease.

The third point was the importance of keeping careful records of all cases. It was not sufficient to get an impression of the value of a drug, this could be quite wrong.

At Glasgow they checked all cases which died, where the body could be obtained, with an autopsy examination.

Contrary to what Mr. Woodrow had found they had noted that about 20 per cent. of dogs presented at a clinic for the first time appeared to be suffering from distemper.

In cases which ran a course clearly recognisable as distemper they had found that 60 to 70 per cent. died or were destroyed. It was estimated that 50 per cent. of the cases that ran this course showed nervous signs. They were dealing with individual cases and not kennel outbreaks.

Since 1948 they had used a variety of special therapeutic substances. In addition they had used, and still used in some cases, salicylates, sulphonamides, penicillin, streptomycin, vitamin preparations and so on. These substances did not appear to alter the recovery significantly.

Details of some of the therapeutic agents they had tried, with the recovery rates were as follows:—

Treatment	No. of Cases with known results	Recovery
CF9	99	35.3%
Hexamine Camphorate	46	36.9%
Vaccine followed by Virus	36	33.3%
Chloramphenicol	20	20%
Chlortetracycline	13	46%
Anti-Distemper Serum	11	45%

The number of cases treated with chloramphenicol, chlortetracycline and anti-distemper serum were perhaps rather small to allow any firm conclusions to be drawn.

He and his colleagues were continuing to try other possible therapeutic substances, but at the moment they felt they had not found any drug which was of undoubted curative value in distemper.

Cases clinically ill with heptatitis contagiosa canis usually ran a short course. Once they recognised the clinical cases it was difficult to get any therapeutic in in time, and few dogs recovered from the acute condition.

Restoring fluid and electrolyte balance was important and glucose-saline or plasma expanders should be administered. He thought it was also possibly useful to give antibiotics and protein hydrolysate. He had no personal experience of immune gamma globulin.

Mr. Bateman said that in his experience none of the drugs he had tried had altered the course of the disease in any way. He was not able to point to any drug other than aspirin. His worry now was to know if distemper had been present from the beginning. With a blood check, where he was sending blood away to find out whether the dog had distemper or not, the dog might make a complete recovery before he got the answer. In one case, a dog whose blood proved to be distemper positive by ferret inoculation, had somewhere about 1 c.c. per lb. bodyweight of serum (about 70 c.c.) on the morning of the initial temperature rise and showed no further symptoms; but there were very few which recovered at that speed. The question arose of making certain distemper was present before claims were made for cures. He had had outbreaks which were recognised in the first day or two without difficulty in young, unprotected, in-contact dogs of known history. At other times he had a dog which ran a temperature and he treated it as distemper because he was not quite sure if it was so or not. He had had a number of swabs taken and sent to Dr. Crofton (who had certain beliefs about the interchangeability of viruses and bacteria). In one case he took a swab and it came back "gram-negative bacilli." The dog received no treatment and recovered spontaneously. In another case which was "gram-negative bacilli" treatment began on the eighth day and there was a full course of 12 injections over 53 days. The dog was discharged cured on the 85th day. That did happen, and it was wise when talking of cures that they should make absolutely certain they are dealing with distemper. If they liked they could try Dr. Crof-

ton's method and let the rest of the profession know their results.

Miss Welch said her first choice for treatment would be egg-adapted vaccine; as an example she quoted the outbreak of hard pad disease which had followed one of the large shows two years ago. She had treated a number of pet dogs in contact with a show dog, all had been acutely ill, but had responded spectacularly to egg-adapted vaccine. Of those which died, one was the show dog which was destroyed in fits having had no treatment, the other was a secondary contact treated prophylactically with serum (probably an insufficient dose), egg-adapted vaccine being in short supply at the time.

She liked hexamethylenetetramine camphorate* and had had good results with it in cases where she expected to get them. CF9 she had found wholly unsuccessful; chloramphenicol was disappointing and she did not now use it. She had not used chlortetracyline† in distemper cases. Serum had given patchy results, it depended on the actual strain of virus; either she had good results or none at all.

Mr. Singleton said the results with CF9 were not surprising; it was a peculiar drug and at first seemed to be one which might be effective against virus infections, but it had never been sufficiently developed. In the early days he used it on 25 dogs showing clinical signs of hard pad and obtained an 80 per cent. recovery rate. Later the results were nothing like that and dropped to about the figure given by Mr. Martin. Generally speaking, from the therapeutic point of view, there was no established preparation proved to be specifically effective against viruses apart from specific antibody. Until such a drug was forthcoming one could not expect antibiotics to achieve any effective control on the distemper virus itself. One must simply look upon them as suitable for the control of bacterial invaders. He was rather interested in what Mr. Martin had said about the diagnosis of distemper and hyperkeratosis.

Mr. Woodrow said that on the vaccine virus treatment he would remind them of the figures given by Dr. Montgomerie at the former Forum as a result of the census from practitioners. It was assumed that the dogs were suffering from the distemper complex, but there was still no explanation given of the high percentage of recoveries. In 1949, 1950 and 1951 the Wellcome Laboratories issued a form of virulent virus and the figures quoted at that meeting showed 80 per cent. recoveries out of 200 cases. The higher rate of recovery was found in dogs supposed to be immune from distemper—92 per cent., compared with 75 per cent. in the distemper non-immune cases. After that they produced the egg-adapted virus and this was sent out with a questionnaire to practitioners. Out of approximately 150 replies there were 33 per cent. reported to be suffering from distemper symptoms in supposedly immune dogs, and 66 per cent. in non-immune dogs. The recovery rate in the distemper immune was 85 per cent. and in the non-immune 80 per cent. That figure was rather similar to those with the virulent virus quoted by Dr. Montgomerie. The figures for avirulent virus treatment had kindly been provided by Mr. Macintyre for this Forum.

* Amphotropin.
† Aureomycin.

Question 3

What advice would you give on management of the clinical distemper-hard pad case at home, with particular reference to diet?

Miss Welch said that she first advised the owner on prevention of spread of the disease. There should be no access to other dogs. The owner should wear an overall and wash after handling the dog if he or she was at all likely to contact other dogs.

Miss Welch said that distemper should be treated as a nervous disease from the outset. In her opinion the most important part of the treatment consisted of rest and quiet even to the extent of putting the dog in a darkened room, shed or kennel for the first week or so, and leaving him alone for hours at a time; this could easily be done when the owner went out to work.

The dog should be kept in the quietest part of the house; this was difficult in the council house and one might have to resort to the kitchen cupboard or the shed. There should be no actual exercise, just an "airing" in the garden three to four times a day for a few minutes.

She did not think the room need be warm provided that the dog had a warm bed and a jacket if necessary; artificial heat, particularly with boiler fumes, was definitely harmful in the broncho-pneumonia case.

Diet was not, in her opinion, as important as rest and quiet. A high protein diet was necessary; the normal protein intake could be doubled, starting with egg and fish and working up the quantity gradually. Carbohydrate could be cut to a quarter the normal intake; she advised rusks instead of biscuits.

Fat was very necessary; many dogs were kept short of fat normally. While diarrhoea persisted it had to be withheld, but in the convalescent dog any form of added fat was useful, *e.g.*, dripping or margarine on toast. Small doses of cod-liver oil could be given, or better still cod-liver oil and malt. Vitamin B complex in the form of brewer's yeast or baker's yeast was used throughout in all cases, who were given vitamin B_{12} also.

She did not know the value of minerals and trace elements in hard pad disease; obviously they were necessary in the case which was also teething and so had a considerable strain on the mineral reserves. She found that four to six months was the most difficult age group to treat successfully. At all times the diet should be as interesting and varied as possible. Meals should be small and given two to three times a day. Most cases could have plenty of milk or milk and water with glucose (in cases with diarrhoea). She did not find that diarrhoea persisted in a case which made a good general response to treatment. Jackets and plenty of fresh air were necessary in pneumonia cases. Routine treatment of eyes, nose and mouth should be carried out, but not to such an extent that the dog was constantly being disturbed.

She felt that much of the failure in clinic cases mentioned by Mr. Martin was due to the fact that these dogs were given unnecessary exercise and excitement in attending the clinic regularly, and that after the first treatment and advice they should be kept at home, the owner reporting for instructions and medicine.

She advised no exercise for six to eight weeks from the commencement of treatment, but did not know for how long hard pad disease was infectious.

Mr. Woodrow said he had nothing to add. It was difficult to give a dog milk or fat because of the diarrhoea; it was almost impossible to prevent diarrhoea in a dog having milk. If the diarrhoea persisted it was as well to take the patient off milk for the time being until the diarrhoea cleared up.

Mr. Bateman said he ran a distemper hospital and insisted on a temperature of 65°; it was kept at that figure but the place was well ventilated. All his dogs had pneumonia jackets. He could not get greyhounds to take milk when first ill with distemper. He made no effort to treat diarrhoea, but as the dogs began to recover the diarrhoea dried up and they took milk. He did not give water at all but provided saline solution. By making the mouth a little salty the dogs tended to take something else. He cleaned the nose and eyes twice a day but insisted on the dogs being left alone at night.

Mr. Martin agreed that rest and quiet were all-important. He saw only dogs which attended a clinic, but he liked to keep an eye on them. The dogs should be kept quiet and allowed out on the lead only long enough to clean themselves. He had not found diet influenced his cases, but he was interested in the point that minerals might be of importance. The B complex he had used frequently and he was now attempting to learn if B_{12} made any difference to the recovery rate. Diarrhoea was troublesome and often resisted treatment.

Mr. Singleton said that as diarrhoea was commonly encountered in cases of distemper he felt that in nursing such a case the question of dehydration was important. Owner and veterinary surgeon should keep an eye on this matter and as soon as a dog showed signs of diminished fluid intake salt should be added to the food in order to increase thirst. If this failed saline should be injected subcutaneously, but it was important to commence these measures at the first evidence of dehydration.

Question 4

What are the indications for the use of gamma globulin in the prevention and treatment of canine virus diseases?

Mr. Singleton said that of course gamma globulins occur naturally in the bloodstream of man and animals and are responsible to a great degree for the state of natural immunity. They constitute the fraction of the serum globulins which are associated with specific and natural antibodies.

He assumed that the question referred to the preparation recently marketed, a polyvalent immune gamma globulin (I.G.G.) prepared from the serum of hyperimmunised dogs.*

The agents used for hyperimmunisation were:—

1. Current strains of distemper viruses selected for their high antigenic properties. These strains were "isolated" and studied periodically from naturally occurring cases in the field.
2. Strains of canine hepatitis virus.
3. Fourteen strains of bacteria frequently encountered accompanying distemper.

The I.G.G. was precipitated by chemical and physical means from the serum of hyperimmunised dogs and was a highly concentrated preparation in dry form. The contents of one ampoule, when dissolved in 1 ml. diluent, were equivalent to 10 ml. of hyperimmunised serum.

The indications for the use of I.G.G. were:—

Prophylaxis against strains of distemper infection in the form of passive immunity.

Prophylaxis against canine virus hepatitis in the form of passive immunity.

The passive immunity lasted for about three weeks.

Active immunisation using virus and I.G.G.

Therapeutically

1. In the treatment of distemper in the early stages. If used in sufficient amounts it might also be helpful in the later stages of the disease.

2. It was particularly helpful in cases of clinical canine virus hepatitis.

3. I.G.G. was perhaps most helpful in the earliest stages of a virus infection before the differentiation between distemper and canine virus hepatitis could be made with certainty.

In the case of canine virus hepatitis it was known that in the majority of instances an animal either died quickly (within 12 to 24 hours) or recovered. If an animal survived longer than two to three days it was unlikely that death would follow unless another infection was superimposed. It might be asked, why treat cases of canine virus hepatitis at all after the second or third day? Whilst a lot more clinical evidence required to be accumulated on the subject, it was known from *post-mortem* that considerable damage was caused to liver and vascular tissues by canine virus hepatitis infection. The clinical effect of residual damage had yet to be assessed, but it might be quite formidable and predispose to superimposed infections. It was possible that administration of I.G.G. could reduce the amount of tissue damage, and as the source of formation of natural gamma globulins was largely in the liver, protection of this tissue was very important. However, whether I.G.G. was capable actually of protecting tissue as suggested, had yet to be established.

I.G.G. had been found most useful in controlling puppy mortality. While the exact relationship between the virus of canine virus hepatitis and the fading puppy syndrome was far from complete, it was known that in kennels where canine virus hepatitis was endemic the incidence of fading puppies was high.

* Gamahtine.

Bitches giving positive results to the complement-fixation test for canine virus hepatitis antibody seemed to be predisposed to neonatal mortalities, and it might be that canine virus hepatitis was a major factor in many of these cases. Recent figures collected at the Canine Research Station of the Animal Health Trust showed that I.G.G. appeared to have a beneficial effect when administered to the bitch a few days prior to whelping, and to each puppy at birth.

The number of bitches involved in the field trial was 29, involving 12 separate kennels. The presence of canine virus hepatitis was established as endemic in all the kennels. Before immune gamma globulin was introduced, of 45 litters comprising 284 puppies 40.3 per cent. survived.

Following the use of immune gamma globulin, of 18 litters comprising 87 puppies 81.7 per cent. survived.

Mr. Martin said he had no personal experience of the use of immune gamma globulin, but he was very interested. He would like to know what types of bacteria were used, and also how many strains of distemper virus were injected into each dog for the preparation of I.G.G.

Mr. Singleton said that in the production of gamma globulin the following bacteria were used: two strains of *B. haemolytic streptococci*, two strains of *Br. bronchisepticus*, two strains of *Staph. albus*, two strains of *P. vulgaris*, and six strains of *Bact. coli*. It was formolised and made up to a strength of 500 million organisms per c.c.

Mr. Martin said the impression they had gained from *post-mortem* examinations of distemper cases was that secondary organisms did not appear to play an important rôle. In some cases there was a broncho-pneumonia caused by secondary organisms. It was mentioned that with canine virus hepatitis of the acute type, and the less acute type, there were a high percentage of recoveries—but that did not agree with his own observations. The cases which he saw usually lived for about five days and the majority of them died. He was interested to learn that Rubarth's disease was endemic in some kennels. He was under the impression that the number of dogs positive to the complement-fixation test had been estimated at 70 per cent. in Sweden and 60 per cent. in Belgium. It was highly probable that they had a high percentage positive to the complement-fixation test in this country: if so, how did they detect the actual carriers of this disease as it had been suggested that the bitches carried the infection?

Mr. Singleton said that at the Canine Research Station, following receipt of a "faded" puppy for *post-mortem*, an immediate request was made for a blood sample from the dam. If this was not possible a number of samples from dogs in the same kennel were collected at random. These were submitted to the complement-fixation test for canine virus hepatitis antibody. It was in this way possible to establish whether or not this infection was present in the kennel. He did not wish to be at all dogmatic about the relationship of canine virus hepatitis to fading puppies as neonatal mortality was a very complex problem. Experimentally it was possible to induce the fading puppy syndrome by the injection of canine hepatitis virus, and the *post-mortem* and histopathological changes were identical with many received from the field. Nevertheless, it was an established fact that the antigenic titre in these cases was only a fraction of the level found in the acute fulminating type of Rubarth's disease occurring in the adult animal. Therefore, the proof of the existence of virus in young puppies was very difficult as the complement-fixation test was not sufficiently sensitive to detect these very low titres consistently.

Mr. Martin asked if they had decided that the bitches were carriers by applying the C.F.T. to the bitches and pups, or by finding a positive C.F.T. in the bitches and inclusion bodies in the dead puppies.

Mr. Singleton said that the "faded" puppy had not had time to build up detectable antibody before death, and intranuclear inclusion bodies had been detected in only two cases. Regarding the figures already quoted, people would have to come to their own conclusions and he was not making any rash claims. Suffice it to say that in the case of bitches shown to have a positive titre to canine virus hepatitis or in the same kennel as "positive" cases the survival rate of their new-born puppies had doubled following the administration of immune gamma globulin which contained antibody against canine virus hepatitis and distemper.

Miss Welch said that since fading puppies responded to penicillin and sulphonamides how could the condition be due to a virus? Perhaps she had not seen cases due to canine virus hepatitis.

Mr. Singleton said he had met veterinary surgeons who got very good results from the injection of penicillin in new-born puppies and others who had obtained no results at all. The puppies at the Canine Research Station were always examined for bacteria. *B. haemolytic streptococci* were only present in 15 per cent. of the puppies which died in the first seven days of their life. It was quite probable that if this were the only factor involved in this group, a response to antibiotics could be expected.

Mr. Woodrow said that he was glad to hear such a fair description of gamma globulin. It had rather dispelled his own previous "sales resistance" to the product, and would go some way to dispelling the antipathy of some practitioners caused by the unfortunate way it was announced in the public press. There should, perhaps, have been better liaison between the Animal Health Trust and the press at the time.

Mr. Singleton said that many of the lay public did not know what passive immunity meant, and many had drawn the conclusion that "Gamahtine" was a replacement for methods of active immunisation. This had caused a lot of confusion but no doubt it was only one of the teething troubles which would soon be corrected and forgotten.

Mr. Bateman said that Messrs. Burroughs Wellcome produced several therapeutic substances; did gamma globulin differ from the others in any way? They might like to know whether there was anything different from the "old fashioned serum." It was

a useful product and he used it, but what happened if it contained viruses which were not killed by the freeze drying?

Mr. Singleton said they were killed.

Mr. Bateman said that if something happened to a dog being treated by serum, the serum would be blamed. They should make sure that gamma globulin was not similarly blamed. He agreed with Miss Welch that sulphonamides were useful with puppies.

Mr. Singleton said he could not answer the question on the difference between the therapeutic serum and gamma globulin as he did not know which viruses were used in the production of therapeutic serum.

Question 5

Will you comment on the value of the different immunising and prophylactic agents used for the prevention of canine virus diseases?

Mr. Bateman confined his remarks mainly to distemper and said originally he immunised with vaccine and virus. If the virus was alive it gave an immunity just as good as any other. The same applied to virus/serum and virus/gamma globulin provided they gave a reaction. He was often troubled when using these methods because he did not know whether the puppies were immune or not unless they showed a temperature reaction. Some dogs that were later proved immune showed no reaction and many dogs were never immune at all. In recent times he had come to use the egg-adapted virus, and the results as far as he could see from distemper in the kennels were that the disease seemed to have disappeared for the time being. For the first time for 24 years he had gone a full year with only two greyhounds with distemper in the premises. He endeavoured to get every dog which came in early, in order to give the egg-adapted virus. He bred many puppies, and vaccinated them all from eight to 11 weeks in the presence of others. He always had about 50 puppies and had had no trouble at all for the last 18 months. He had vaccinated 222 this year at an average age of nine weeks old. If the value of the egg-adapted virus remained in its present state there was no reason to risk live virulent virus at all. It seemed to work; he had some 600 dogs, and for many months had been without a distemper case. Mr. Woodrow had also said that Central London was distemper free.

Mr. Bateman thought too much was made in the laboratory about canine virus hepatitis. Occasionally a greyhound was found dead and no doubt if he sent the blood away for a test it would come back as canine virus hepatitis. He was quite sure that many dogs which remained well would give a reaction to canine virus hepatitis. He felt that sometimes too much was made of it by the pathologist. From his point of view it was extraordinary, if canine virus hepatitis was a disease as serious as some pathologists claimed, that he was able to go on with an empty hospital and practically nothing happening. Owing to the frequent movement of dogs in and out of his premises there was always a danger of introducing disease. He had no such cases of disease at present.

There was much to commend the use of immunising agents, as there was nothing more disheartening than to treat 40 or 50 dogs under one roof with distemper.

Mr. Martin said that in Glasgow the general impression was that egg-adapted vaccine was working well, but they still received a number of obvious cases of distemper which had been vaccinated recently and had gone down with the disease. He was under the impression that a difference between the therapeutic serum and gamma globulin was that the former product did not contain antibodies for Rubarth's disease.

Miss Welch said she wondered how much maternal immunity interfered with the establishment of a natural or artificial immunity, and recalled an outbreak in four-year-old litter brothers and sisters (not inoculated) whose dam had been inoculated with virus/serum and showed a considerable temperature requiring extra serum. The only known dog to catch the same infection was also four years old (she had virus/serum at four months) and her dam had also a considerable reaction after virus/serum inoculation. Diagnosis was confirmed by blood test in all these cases. The dogs had a more adequate opportunity to acquire a natural immunity.

Mr Singleton said that no doubt egg-adapted vaccine was very effective, but outbreaks of distemper were still occurring and dogs given egg-adapted vaccine were breaking down. He did not think people should be too complacent about the situation. There were two important factors to consider; they did not know the length of immunity conveyed by egg-adapted vaccine and further, the current viruses might change and previously immunised dogs might no longer be immune. These were possibilities which should be kept in mind.

Mr. Woodrow said he had been more optimistic in the last few months as the distemper complex seemed to be on the way out in Central London, but they must not necessarily say that egg-adapted vaccine was doing it. Eighteen months ago he was having a fair number of failures to establish immunity, but few had occurred since. In one London store the figures of inoculation had grown from 138 at the time of the previous forum to 243, and they still had not received a complaint from purchasers of a breakdown or failure to establish immunity. It might be only due to the fact that as London and the country was fairly free from distemper, there was little opportunity of subsequent infection.

Mr. Bateman said they were living in times when distemper was not making its appearance at all; it was an unusual thing for him. He did not lose sight of the possibilities of other methods of vaccination. He had 19 dogs now 15 months old, Crofton vaccinated, due to come in soon and he might be able to say what was happening when, and if, they were exposed. Length of immunity mattered a lot. To people with large kennels any immunity would be enhanced in the presence of other dogs. He doubted whether any particular method of immunisation w[illegible] giving permanent immunity in the absence of natural stimuli, he vaccinated dogs with egg-adapted vaccine a second time. They were done at nine weeks, and

after 15 months they were done again. For the sake of about £2 a puppy vaccinated, he could thus save 50 for the price of every unprotected dog that died. He did not pay much attention to changing virus; in his opinion if a dog was immune to one, it would be immune to all so-called types of distemper virus.

THE GENERAL DISCUSSION

Dr. Bell then invited members of the audience to join the discussion.

Mr. Roper asked whether Mr. Bateman gave a meat-and-bone meal or whether he had some other mineral in mind. He was using so-called hard pad serum and wondered whether that serum or distemper serum itself were being more commonly used. The classical distemper, with the more chronic picture, seemed to him to be coming more common again. He would like to ask Mr. Martin how long-standing were his cases before treatment was commenced; what was the serum dosage used; was it given intravenously, and had any dogs been previously vaccinated with egg-adapted or other method? Was there any age-incidence as regards the dog's chance of recovery? The speaker was especially pessimistic with suspected hard pad strains in very young dogs. On the question of diet, wheat germ was more easily tolerated than yeast. In connection with the use of gamma globulin in puppies and bitches tested for canine virus hepatitis, he would like to know more about the tests—were they all negative for *B. haemolytic streptococci*? Did Mr. Bateman think some cases of haemorrhagic gastro-enteritis in the greyhound were, in fact, cases of Rubarth's disease? He was pleased with egg-adapted vaccine, he had used it for over 400 cases of which 220 were in the last 12 months. To his knowledge there had only been one breakdown in that time. It was in a dog that he had not vaccinated himself, and which recovered uneventfully.

Mr. Pool said that he first attended the Central in 1921 as a guest, and at that meeting Henry Gray and Hunting were principal speakers, though on another subject. Apart from the use of specific immunological procedures, he was under the impression that they were as successful in their treatment of distemper as we are to-day. Though a virus was not then proved to be the cause, it was commonly believed to be. Then came Laidlaw and Dunkin's work but there was nothing startling about the results. They demonstrated what was expected to occur.

Much had been written about the treatment of infections of the central nervous system in both man and animals with hexamine compounds, and he noted that one had been mentioned that day; there was quite a large volume of literature about it. An important commission in the U.S.A. studied the whole literature on these infections a good many years ago. They published three separate reports printed in book form. They discussed the claims about this drug and were emphatic that there was no logical basis for its administration for such diseases.

For every disease there were large numbers of claims about good results in drug treatment, even against conditions that definitely did not respond to drugs. He suggested that if sterile distilled water had been used instead of the drugs mentioned at the meeting the results would have been about the same, say 20 to 45 per cent. The lay public and many veterinary surgeons thought gamma globulin was something magical; it was merely a more refined product than the antiserum. He did not know the product spoken of as CF9 and would like to know what it was. There did not appear to be any real evidence of its value.

Col. Bushman said he had two immune bitches whelping shortly and they had been running with a classical case of distemper complex. Would the puppies be born with any immunity at all? If not, what should he do?

Mr. Carter said that if London was free from distemper did the influx of people and dogs to the new towns have any effect? Usually the move was followed by a mild epidemic of distemper. Did this mean that the dogs were challenged by a "local brand," or was it because the environment was changed?

Mr. Steward said that the use of therapeutic serum could confuse one's diagnosis if one did not know whether to attribute any improvement to its anti-viral or anti-bacterial properties. It was most important to know this and he preferred to use anti-viral serum alone at first (where serum was indicated) and later, if necessary, use anti-bacterial agents (*e.g.*, sulphadimidine, penicillin, etc.). He was certain that chloramphenicol was of greater value against the virus than the other antibiotics, penicillin and streptomycin. Egg-adapted vaccine was an extremely effective prophylactic but he got some breakdowns, mostly in Alsatians. If it was recommended that they should use it twice what was the most usual date for the second inoculation? In his experience the hepatitis cases did not respond to treatment and did not display typical symptoms. These cases did not respond to antibiotics as bacterial infections did, but some showed the typical cloudy eye which helped in diagnosis; a few with acute hepatitis died in the first 18 hours. As Miss Welch was afraid of the human carrier she must be forced to carry a large number of overalls; but she said nothing about the syringe. He was certain there could easily be trouble with contaminated needles. He did not use a lot of primidone as it was very expensive; they might get good results with phenobarbitone or *Tabs. acetyl salicyl* (flavum or rubrum).

Dr. Bell asked whether freeze-dried serum could be an infective agent?

Mr. Hodgman stated that there was no risk of free virus being present in Gamahtine owing to the method of its production and ultimate treatment with ultra-violet rays. He then went on to say that Dr. Larin was present and he could give more information on the principal points.

Dr. Larin said that no live distemper or canine hepatitis virus could possibly be present in the immune gamma globulin for the following reasons:—

(a) Only healthy hyperimmunised dogs were used for gamma globulin production.

(b) To his best knowledge, procedures of the extraction of the immune gamma globulin from antiserum excluded a possibility of the above viruses—even if they were present in antiserum—being extracted together with gamma globulin.

(c) The final product was subjected to ultra-violet irradiation and tested on dogs.

Dr. Mansi said that with Rubarth's disease they had had many puppies born to immune dogs; some of these died within a few days of birth, mortality differing from one litter to another. They found no virus or antigen in their tissues. Others on reaching the age of three months were found to be fully susceptible.

Dr. Montgomerie said it was clear that to get a good lasting immunity to distemper virus infection it was necessary to inject living virus. This virus was so fragile that the outstanding problem was to find a means by which it could be put into the normal method of distribution of biological products, in a form in which it would stand up to the rigours of the distribution process and remain viable for sufficient time. He believed that in properly prepared egg-adapted virus they had a product which would meet that special requirement and, handled with reasonable care, be viable and capable of stimulating immunity when injected into the dog.

The question of the interference with the establishment of immunity following the injection of virus which might arise from maternally transmitted passive immunity had been raised. While there was, perhaps, no good laboratory data which would provide a definite answer to this question, there was evidence that the puppy born from a highly immune bitch was more difficult to immunise. He believed that that type of immunity interfered to a greater extent than did injected serum. It was in these circumstances that the recommendation had been made that puppies injected with egg-adapted virus at a young age, say five or six weeks, should receive a second dose of virus when over 12 weeks of age. He could well understand the veterinary surgeon in charge of a large breeding kennel wishing to obtain active protection at the earliest possible age. He knew nothing

against the use of egg-adapted virus in the very young puppy except that it might be a bit risky to depend on the immunity it stimulated since some of these puppies might still have a high level of maternally transmitted immunity. Certainly in these circumstances cover should be obtained by a second injection.

He was a little surprised that the risk that some other virus infection might be transmitted when serum was injected still appeared to exist in some people's minds. He knew of no evidence to support the vague suggestion that this had occurred with ordinary distemper serum and was perfectly satisfied that material which had gone through the chemical process associated with the production of gamma globulin would not contain a virus transmissible from dog to dog.

The relationship between a concentrated and an unconcentrated serum did not appear to have been cleared up. Surely, all that could be said was that in preparing gamma globulin, for example, the antibodies in the original serum were concentrated to 10 times their original potency. If the dog from which the serum was obtained had only a low level of immunity, then the quality of the dried gamma globulin obtained would be correspondingly low. Put rather crudely, all that could be said was that the value was increased 10 times from that of the original material and the essential must be to start off with serum of high potency.

This question of the use of a serological product in the prevention of losses by fading interested him. He was not satisfied that any value in serum injection depended on its containing immune bodies, because there was no evidence that fading in puppies was due to an infection or a lack of antibody transmitted from the dam. It might well be that the protection depended on the introduction of serum globulins, and in any investigation it would be quite necessary for a proportion of each litter to be given normal serum as controls. Certainly, in some other species the injection of normal serum soon after birth seemed to be an advantage in preventing deaths among the new-born.

Mr. Singleton said that many bitches carried *B. haemolytic streptococci* and these organisms could be recovered from the cervix and vagina. However, it was always difficult to establish the pathogenicity of these organisms and come to any definite conclusions as to their significance. He again mentioned that these organisms were detected in only 15 per cent. of "faded puppies" received at the Canine Research Station. He regretted that he had no data to offer on the use of normal serum injected into puppies.

Mr. Woodrow said that he thought chloramphenicol was the most useful of the antibiotics but many dogs treated at home were mouth shy. There were preparations available for children which were palatable and easy to give, for example, chloromycetin palmitate.

Miss Welch said that no syringe used on an infectious animal should be used on another animal until it had been adequately dealt with. The same applied to needles. She always carried one clean and one dirty overall; one should never go to susceptible puppies after treating a case of distemper complex. If one was asked to immunise a dog out of Battersea Dogs' Home, what was the best time to give egg-adapted vaccine; did one give egg-adapted vaccine and wait for the balloon to go up, or vice versa?

Dr. Montgomerie said he personally would give the vaccine* at once.

Mr. Martin said that few of the dogs he saw had ever received any prophylactic against distemper. Serum was used only in established cases, the dosage rate being 1 ml. per 1 lb. bodyweight given parenterally but not intravenously. As to the age incidence of distemper they had found in Glasgow that the majority of cases developed signs between four and six months of age. He agreed with Mr. Pool that they might get equally good results from the use of sterile water. He was not claiming that any substance was of value in the treatment of distemper. Mr. Steward had said chloramphenicol gave him useful results in dogs "which had resisted other treatments," but how did he know which treatment had eventually effected a cure?

* Epivax.

(*Concluded at foot of adjoining column*)

"Black Disease" (Infectious Necrotic Hepatitis) in a Heifer

BY

T. G. G. HERBERT
Aberaeron,

AND

L. E. HUGHES
Veterinary Investigation Centre, Aberystwyth

"BLACK Disease" is an important cause of loss in sheep in Mid-Wales, and has probably been responsible for the majority of deaths in adult sheep during the past two years in the four counties of Cardigan, Montgomery, Brecon and Radnor. The disease was first encountered in this area by one of us (L. E. H.) in 1946 and since then it has been diagnosed in all four counties in the province covered by the Aberystwyth centre. The disease appears to be on the increase and is responsible for heavy losses in the lowland and marginal sheep flocks. During this period it has not been reported previously in any other species either in Mid-Wales, or, so far as the authors are aware, elsewhere. Although *Clostridium oedematiens* is alleged to cause "blackleg" or "blackquarter" in cattle occasionally, this is believed to be the first report of "black disease" in a bovine animal.

The subject of this report was a black-and-white Friesian heifer, two-and-a-half years old, bred on a farm on which a number of unexplained losses had occurred during the past two years. This animal had grazed with others of the same age during the day, and was tied up indoors at night. On December 24th she was seen to be eating less than usual, not cudding normally and not defaecating. When seen on Christmas Day she was rather blown, with slightly laboured breathing. She was eating and cudding a little, the skin was elastic and pliable, and temperature was 101° F. with visible mucous membranes normal. The heifer grunted and showed signs of discomfort when palpated over the abdomen and in the posterior portion of the sternum.

Mr. Bateman said he used a cattle mineral mixture. With regard to treatment of encephalitis it was policy to remove the pressure of the cerebro-spinal fluid if even some dogs would have a chance of living. He could recall a case in which fluid was removed and the animal got up and fed the same day. Often dogs were not cured, but he considered this enhanced their chances of recovery. Haemorrhagic gastro-enteritis in greyhounds was not so common as formerly but they tended to treat it as an allergic condition. Mr. Pool had referred to Henry Gray and Hunting, and no doubt these gentlemen knew as much about the treatment of distemper as they knew to-day. There was still nothing they knew to affect the course of the disease. Sewell's original book was just as good as anything that had been produced in recent times on distemper treatment. Colonel Bushman should separate the two bitches which were due to whelp, or the other dog running about would infect the puppies before they were a month old. A plentiful supply of soap and water should be used to wash the kennels as the virus did not live long in hygienic conditions.

A vote of thanks to the forum ended the meeting.

A tentative diagnosis of indigestion was made with a guarded prognosis as the cause was not established. The animal was treated with vitamin B_{12} and sulphadimidine by injection.

When seen again on December 27th the heifer had ceased eating and cudding. The owner reported that since the last visit he had given her 1 lb. of Glauber's salt and that some faeces had been passed which were hard in consistency, black in colour, and contained blood and mucus. On examination the heifer was empty with no sign of flatulence and a temperature of 101° F. Faeces passed during the course of the examination were seen to contain a small amount of blood; she grunted on abdominal palpation, particularly when palpated over the region of the liver. The animal died at 1 a.m. on December 28th and was examined *post mortem* at 11 a.m. the same day.

Post-mortem Appearances

The *post-mortem* examination revealed a carcase in good condition with the abdomen considerably distended by gas and with the anus protruding. On opening the skin, numerous petechiae were seen subcutaneously and a small amount of yellow gelatinous oedema was present in both axillary regions and the thighs. The abdominal cavity contained a large quantity of blood-stained fluid; the omentum was stained red. The connective tissue surrounding the pancreas was distended with yellow gelatinous oedema and this organ was adherent to the small caudate lobe of the liver. This lobe contained a pale yellowish-white area of necrotic tissue about 1½ inches in diameter extending into the depth of the organ. The necrotic area was surrounded by a considerable area of hyperaemia, part of which showed evidence of early adhesion with the pancreas. This lesion was very similar to the characteristic lesion of black disease in the ewe. During the course of the examination of the liver numerous flukes were seen. Other features of the *post-mortem* examination were a haemorrhagic inflammation of the abomasum, some degree of inflammation of the rumen, and a patchy enteritis. The kidneys were pale, soft, and inclined to be pulpy, but not congested. The heart was surrounded by an excess of a straw-coloured fluid containing fibrinous clots; the lungs appeared normal but the posterior ribs showed evidence of an early pleurisy.

A tentative diagnosis of black disease was made and material brought back to the laboratory for examination. Cultures prepared from the gut and the spleen and grown aerobically proved negative and no significant organisms were isolated. A portion of the necrotic lesion in the liver, ground up with normal saline for inoculation into guinea-pigs, was examined microscopically, and sown on to blood agar plates. The smears prepared from this inoculum, stained by Gram's method, contained innumerable large Gram + sporulating rods, indistinguishable microscopically from *Cl. oedematiens*. The blood agar plates were incubated anaerobically at 37° C. overnight. This attempt to isolate *Cl. oedematiens* in pure culture failed as the plates were overgrown by a gram-negative rod which could not be separated from the Clostridia present. 0.25 ml. of the ground-up liver tissue was inoculated into a guinea-pig intramuscularly and at the same time a number of guinea-pigs were immunised as follows:—

1. 0.5 ml. *Cl. oedematiens* antisera (a mixture of types A and B).
2. 0.5 ml. *Cl. septique* antiserum.
3. 0.5 ml. *Cl. chauvei* antiserum.

A further series of guinea-pigs were immunised as above but each received in addition, 0.5 ml. *Cl. welchii* type B. All these inoculations were made on December 29th, 1955, at about 11 a.m.; during the late afternoon of the same day the immunised guinea-pigs were challenged intramuscularly with 0.25 ml. of the ground-up liver. By the following morning the control guinea-pig (ground-up liver only) and all the immunised pigs except two which received *Cl. oedematiens* antisera were dead. The *post-mortem* examinations on the five dead guinea-pigs revealed a picture of *Cl. oedematiens* infection, with abdomen and chest covered subcutaneously by a yellow sero-fibrinous exudate. These results indicated that *Cl. oedematiens* antiserum protected against the ground-up liver lesion. The *post-mortem* picture, the presence in the liver lesion of bacteria identical in appearance with *Cl. oedematiens*, the results of the guinea-pig experiments, and the *post-mortem* findings in the guinea-pigs support a diagnosis of "black disease."

Discussion

A number of points worthy of discussion arise out of this report. In the first place "black disease" has never been diagnosed in the sheep on this farm which, in the past, have had a good bill of health. Secondly, the length of illness in this heifer should be contrasted with the duration of "black disease" in sheep; days compared with hours. Finally, attention is drawn to the similarity in the clinical and *post-mortem* pictures seen in this heifer and those in the disease known as "red water disease" or infectious ictero-haemoglobinuria seen in parts of U.S.A., Central and South America. A very significant difference, however, is the absence in the heifer of signs of haemoglobinuria at all stages of examination, before and after death. Infectious ictero-haemoglobinuria is caused by *Cl. haemolyticum* and it is of interest that this organism was isolated by Soltys & Jennings (1950) from a cow which appeared to have died from this disease. Unfortunately no clinical information was available to these authors, but no evidence of haemoglobinuria was seen in the urinary bladder or the calyces of the kidneys on *post-mortem* examination. In view of this, a question arises as to whether, in fact, they were dealing with ictero-haemoglobinuria or black disease caused by *Cl. haemolyticum*.

Reference

SOLTYS, M. A., & JENNINGS, A. R. (1950). *Vet. Rec.* **62**. 5-6.

Current Literature

ABSTRACTS

Pathology of Contagious Foot-Rot in Sheep. DEAN, H. M., & JENSEN, R. (1955). *Am. J. Vet. Res.* **16.** 208–8.

The authors studied the gross pathology and histological changes occurring in contagious foot-rot in sheep. One hundred and twelve affected feet were examined for both gross and microscopical changes, and a further 569 feet were examined macroscopically only. During the course of the study the disease was transmitted experimentally for three successive transfers by applying the necrotic tissue, and exudate, to the scarified interdigital integument of normal sheep.

The incidence of the disease in the four feet, and in the digits of the foot, were found to be equal. It was seen that in the early stages of the disease the cells of the *stratum granulosum* and superficial layers of the *stratum spinosum* underwent swelling and became vacuolated and necrosed. The vacuoles coalesced to form large cavities which became infiltrated with leucocytes. There was oedema of the papillae of the corium which also became infiltrated with leucocytes.

In advanced lesions the changes were similar, but it was noticed that liquefaction and necrosis sometimes occurred without vacuolation. The necrotic changes were followed by detachment of the affected portion of the hoof.

Little mention is made of the micro-organisms found in the lesions, but it was noted that neither bacteria nor spirochaetes were found at the point where the lesion was advancing into healthy tissue. Elsewhere in the lesions cocci, rods, and filaments were demonstrated but do not appear to have been identified. No spirochaetes were demonstrated in any of the cases.

C. B. H.

The Galactopoeitic Role of Growth Hormone in Dairy Cattle. BRUMBY, P. J., & HANCOCK, J. (1955). *New Zealand J. Sci. & Tech.* **36.** 417–36.

A growth hormone preparation was injected daily subcutaneously to identical twin cattle during (*a*) a 12-week period over the peak phase of lactation and (*b*) a four-week period at the latter end of lactation. In addition to normal control cows, a third group of cows were treated with anterior pituitary thyrotropic hormone (TSH) or thyroxine in amounts equivalent to that contained in the growth hormone.

In both trials an increase occurred in milk yield and butterfat production and the animals showed an apparent increase in efficiency of production. During the period of experiment the treated animals lost weight and showed increased heart rates. There was no diabetogenic effect.

The authors cannot account for the mechanism of increased milk yield produced by the growth hormone but suggest that during milking the output of oxytocin, known to be released by the stimulus, itself stimulates the anterior pituitary to produce ACTH and TSH Oxytocin may also, they suggest, increase the rate of milk secretion.

F. R. B.

Effect of Chlorpromazine on Convulsions of Experimental and Clinical Tetanus. KELLY, R. E., & LAURENCE, D. R. (1956). *Lancet.* Jan. 21st, 1956. 118–21.

The treatment of tetanus convulsions in human patients is attracting much attention. Up till now two principal methods have been developed, the use of sedatives and mephenesin, and the use of neuromuscular-blocking agents with light anaesthesia. While these methods have merits a simpler alternative is needed, and what is needed is a drug or combination of drugs which will abolish the muscle spasm without affecting respiration or abolishing consciousness. With this need in mind the effect of both old and new drugs on experimental tetanus was examined. So far the only drugs of any promise are chlorpromazine and promethazine which have similar chemical constituents.

Rabbits were given an intramuscular injection of tetanus toxin into one hind leg, the dose being adjusted to cause pronounced resting tetanus in the injected leg, the other being minimally affected or unaffected and so acting as a control. Electromyographic records were taken from both hind legs of the conscious animal. Drugs being tested were injected intravenously and their effect on the tetanus spasm observed. A standard afferent stimulus consisted in dropping a weight on the metal frame supporting the canvas sling in which the rabbit was slung.

Chlorpromazine 1 mg. per kg. bodyweight intravenously abolished "spontaneous" tetanus (*i.e.*, no intended afferent stimuli applied and reflex tetanus for a mean of 77 minutes—27 to 120 min.). Larger doses of chlorpromazine abolished reflex tetanus for up to four hours. The animals were quiescent after chlorpromazine 1 mg. per kg. bodyweight, but normal rabbits given this dose would hop about if encouraged. Respiration was unaffected.

Promethazine also abolished tetanus, but only in high dosage (4 mg. per kg. bodyweight) and for a shorter time (less than one hour).

With these results in mind it was felt justifiable to attempt to control human tetanus convulsions with chlorpromazine alone ; for spontaneous respiration and retained consciousness might be of very great advantage, whereas unconsciousness, with or without neuromuscular block, prolonged for many days and possibly even weeks, could not but influence the patient unfavourably.

A description is then given of the treatment of tetanus in a boy aged two and a half years who had crushed the tip of a finger in a door. At the time of admission to hospital he had generalised convulsions and trismus was continuous. Chlorpromazine in a dose of approximately 1 mg. per kg. bodyweight given intravenously produced a sound sleep with relaxation of the mouth. This effect lasted three hours. An intravenous drip was maintained and doses of chlorpromazine were given into this every 2 to 5 hours according to the extent to which relaxation was maintained. At no time was consciousness lost as a result of administering the drug. Chlorpromazine was given for 16 days. The child had a slow but uneventful convalescence.

G. F. B.

Clinical Evaluation of Piperazine Adipate as an Anthelmintic in Horses. PROCTOR, D. L., SINGER, R. H., & SUTTON, H. H. (1955). *Vet. Med.* Nov. 575–8.

The anthelmintic efficiency of piperazine adipate was assessed from observations on 229 foals, 176 yearlings, and 113 mares of the Thoroughbred and Hunter class. Each animal received 3 oz. (90 grammes), of piperazine adipate, except for foals under 450 lb., to which 1½ oz. (45 grammes), was given. Phenothiazine at a dosage range of 6 to 25 grammes was also given with the piperazine adipate, the combined anthelmintics being administered by stomach tube.

Faecal egg counts were made on 102 animals. In all cases the numbers of ascarid and strongyle eggs fell to zero after treatment, except for two animals in which a count of 200 strongyle eggs per gramme was made.

Two foals weighing 350 and 450 lb. respectively, with a high ascarid infestation, were each dosed, with 6 oz. (180 grammes) of piperazine adipate. The foals were destroyed seven days later and examined *post mortem*. No adult ascarids or strongyles were found in the gastro-intestinal tract. There were no macroscopic lesions which could be attributed to the administration of piperazine adipate, and no lesions were detected by a microscopic examination of sections of the liver and kidneys. A full haematological examination was made of the blood of the two foals before and after treatment, and in addition the blood of 21 foals receiving the piperazine adipate and phenothiazine was also examined. No abnormality was detected, except for a 25 per cent. reduction of the chloride content of the blood of the two foals which received the massive dose of the piperazine adipate. The chloride level of the blood of the 21 foals was unchanged.

D. W. J.

Oxytetracycline in Bovine Mastitis. BARNES, L. E. *Amer. J. Vet. Res.* **16.** 386-90.

The author has investigated the value of oxytetracycline (Terramycin) for the treatment of mastitis in one herd. Though the herd was free from *Str. agalactiae*, other pathogenic organisms accounted for infection in 81 (16 per cent.) of the 491 quarters examined. Of these organisms *Staph. aureus* and *Str. uberis* predominated and, before treatment, diagnosis of mastitis was made whenever one or other of these organisms was identified in a milk sample.

Treatment consisted in infusing into infected quarters 400 mg. of antibiotic in ointment form on three successive days and in severe cases a larger dose was given accompanied by 1 or 2 g. intramuscularly.

Of 115 cases (presumably quarters) treated, the causal organism was eliminated in 51 per cent. and it is stated that symptoms of mastitis were relieved in all quarters. The response varied considerably, and while 82 per cent. of *Str. uberis* cases and 70 per cent. of *Bact. coli* cases gave good results only 25 per cent. of staphylococcal cases responded.

Best results following intramammary infusion were obtained in recently acquired subclinical infections, though clinical improvement in acute cases was assisted by intramuscular administration of Terramycin. The antibiotic was not, however, free from irritant effect when given by both these routes.

Strains of streptococci and staphylococci were uniformly sensitive to 1.0 μg. per ml. of Terramycin in solution and since the response in staphylococcal mastitis was not so favourable, the author suggests that higher doses might be expected to give better results.

S.J.E.

Milk-borne Tuberculosis, 1921-53. LETHEM, W. A. (1955). *Mon. Bull. Minist. Hlth Lab. Serv.* **14.** 144–5.

It is believed that most cases of abdominal tuberculosis in children under five years old are due to the consumption of infected milk. Between 1921 and 1944 the death rate from this condition fell from 136 to 6 deaths per million children in London, and from 252 to 60 per million in rural districts. During this period there was a steady increase in the amount of milk heat treated and in the number of tuberculosis-free herds. Thus in 1944 98 per cent. of the London milk supply was pasteurised or sterilised, as against about 50 per cent. in 1921, whereas the consumption of raw milk was still common in rural districts.

Between 1944 and 1953, the death rate fell still further to 4 per million children in London and 12 per million in rural districts. Practically the whole of the London milk supply is now heat treated and 58 per cent. of our milk is from attested herds, but an unknown amount of raw, undesignated milk is still consumed in country districts.

E. A. G.

DIGEST

Cystic ovaries

A marked increase in the incidence of cystic ovaries among dairy cattle was recorded by Roberts (1955), in a survey of 352 cases during the period 1943–53. The symptoms were usually first noted 30 to 90 days after parturition, and consisted of nymphomania in 70 per cent. of cases, while the remaining 30 per cent. of affected animals failed to come into oestrus. However, oedema of the vulva, and relaxation of the sacrosciatic ligaments were observed in both manifestations of the disease. Approximately 50 per cent. of all cases were recorded from December to February.

Examination revealed that both ovaries were cystic in 44 per cent. of the affected animals, the left ovary in 23 per cent., and the right ovary in 33 per cent. of cases.

Various forms of treatment were used, and included the intravenous injection of sheep pituitary, or chorionic gonadotropin, and subcutaneous injections of pregnant mare serum. Roberts observed little difference between the two intravenous injections to which 80 per cent. of cases responded successfully, and normal oestrus was usually shown 11 to 30 days after treatment. The recovery rate was lower when an intramuscular injection of chorionic gonadotropin, or the subcutaneous injection of pregnant mare serum, was used. The manual rupture of the cysts prior to injection of the hormonal preparations did not affect the recovery rate. In cases where re-treatment was necessary, Roberts advised the use of an alternative hormone preparation to that previously used.

D. W. J.

Reference

ROBERTS, S. J. (1955). *Cornell Vet.* **45** (4). 497—508.

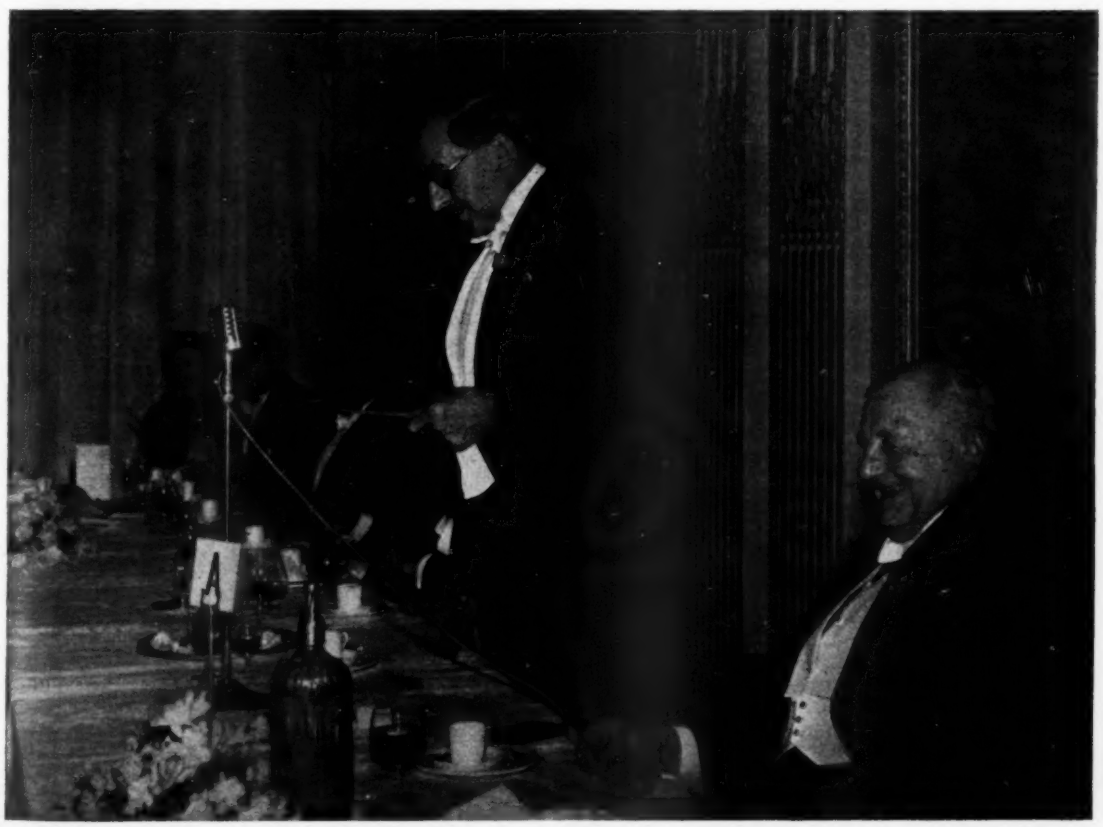
The R.C.V.S. Annual Dinner

The annual dinner of the Royal College was held at the Hyde Park Hotel on April 12th, when the President and Mrs. Sumner welcomed a large number of guests drawn not only from all departments of the profession, but also from governmental, official, scientific, academic, cultural and civic bodies. The guest of honour was the Minister of Agriculture, the Rt. Hon. D. Heathcoat-Amory, M.P., while among many other guests of note were:—

Earl St. Aldwyn, Parliamentary Secretary to the Ministry; Mr. G. R. H. Nugent, M.P., Parliamentary Secretary to the Ministry; Mr. N. M. S. Macpherson, M.P., Parliamentary Under-Secretary to the Secretary of State for Scotland; Sir George Dunnett, Deputy Secretary to the Ministry of Agriculture; Mr. A. R. Manktelow, Deputy Secretary to the Ministry; Mr. W. C. Tame, Under Secretary to the Ministry; Mr. C. P. Quick, Assistant Secretary, Animal Health Division; Sir Alexander Glen, Secretary to the Department of Agriculture for Scotland; Mr. E. Wilkinson, President of the B.V.A., and Mrs. Wilkinson; Mr. J. N. Ritchie, Chief Veterinary Officer; Sir Weldon Dalrymple-Champneys, Deputy Chief Medical Officer, Ministry of Health; Sir Hilton Poynton, Deputy Under-Secretary, Colonial Office; Sir Keith Murray, Chairman, University Grants Committee; Mr. W. G. Agnew, Clerk of the Privy Council; the Rt. Hon. Tom Williams, M.P.; the Rt. Hon. George Brown, M.P.; Mr. A. J. Champion, M.P.; Mr. A. R. Hurd, M.P.; Sir Paul Sinker, Director General of the British Council; Dr. D. W. Logan, Principal of the University of London; Colonel S. J. Worsley, Secretary of the Inter-University Council for Higher Education Overseas; Mr. J. K. Knowles, Secretary of the National Farmers' Union; Professor P. E. Mullaney, President of the Irish Veterinary Council; Mr. H. Steinman, President of the Pharmaceutical Society; and Mr. C. Mervyn Hill, President of the Association of the British Pharmaceutical Industry.

In the course of his speech proposing the toast of the Royal College, together with the name of the President, the Minister said:—

"I have brought with me to-night my usual bodyguard—two Parliamentary Secretaries—and a staunch ally from Scotland, Mr. Niall Macpherson—plus a posse of very reliable senior officials. But if I drop any technical bricks I shall rely first and foremost on that doughty Aberdonian, my Chief Veterinary Officer, to come to my rescue. Mr. Ritchie is a tower of strength to me at all times but the fact that he has recently received the high distinction of being made a Fellow of the Royal College and is thus as



A felicitous moment during the Minister's speech proposing the health of the Royal College.

it were a friend at court makes me confident that there is no deep water into which I can fall that he cannot get me out of. May I also say how delighted I was to hear that Mr. Brennan has just been elected to your Council.

"I am particularly pleased about the honour you have paid Mr. Ritchie and Mr. Brennan because it seems to me to symbolise—most fittingly, if I may say so—the excellent relations that exist between my Department and the governing body of your great profession. I know how much the really fine work that is done on animal health in this country depends on very close co-operation all the way along the line between the Ministry and your profession. I should like to take this opportunity of thanking you, Mr. President—and through you the Council of the Royal College—for your part in this excellent state of affairs. I should like to say, too, how proud I am of the veterinary officers in my own Department.

"Since its early days the College has gone from strength to strength thanks in large measure to the excellent way in which it has been served by its Presidents and other officers. Of them all I doubt whether any can better your President's record of service to the profession. You are, I believe Sir, the representative of the fifth generation of veterinary surgeons in the same family—and as if that is not enough your son is carrying on the good work. Your father was also a President of the College and I really wonder what the profession would have done without the Sumner family.

"To-day the College is in a very flourishing state. Its reputation is high and the British veterinary profession stands second to none in the world.

"We are represented on the World Health Organisation in Geneva; the Principal Veterinarian to FAO is Sir Thomas Dalling; and I gather that Dr. Taylor of Weybridge has been invited to be guest speaker on parasitology by the Caribbean Veterinary Association. This is a well-deserved honour for Dr. Taylor who is, of course, one of the world's leading authorities in parasitology.

"When we survey the progress that has been made in animal health how grateful we have reason to be to our predecessors for their devoted work and how hopeful surely we can feel for the future.

"But while many diseases have been eliminated, new ones have appeared, to be enthusiastically grappled with by the profession. You will, no doubt, down them too in due course, but I do not think you need fear working yourselves out of a job.

"Fowl pest, for example, has been extremely troublesome but there are grounds, surely, for hoping that we are now getting on top of it. It is much the same story with swine fever. In 1940 3 per cent. of pigs died from it; less than ½ per cent. die now. These losses would be still further reduced if many more farmers would have their pigs vaccinated with Crystal Violet. I would like more to be taking advantage of the Registered Vaccinated Herds Scheme.

"One of the most spectacular achievements of recent years has been the progress in freeing our herds of bovine tuberculosis. In 1936 we had to slaughter one in 300 cattle because of it; to-day less than one in 8,000—nearly a 30-fold improvement.

"It is only 20 years since the Attested Herds Scheme was introduced. In that time the number attested has gone up from only one to well over 600 in every 1,000. It was good that last year 1,000,000 more cattle became attested.

"A politician always burns his fingers when he turns prophet, but on this occasion I will take my courage in both hands and suggest that well within 10 years, by about the time I am getting my second wind as Minister, bovine tuberculosis as a serious problem will have passed into veterinary history, and the profession will have added one more name to its battle standards.

"I would like to congratulate you all on the great attention you are so wisely paying to preventative work—and I trust our farmers are realising more and more the value of that aspect and are seeking your advice in time."

The President's Speech

The Minister's speech was greeted with warm applause, after which the President rose to reply. Mr. Sumner said:—

"To you, Sir, we have an especially close responsibility, for whatever his vocation within our profession there is no member of the College in the United Kingdom but is affected by the work of your Animal Health Division. You have been so good as to refer to the long connection of my family with the veterinary profession. It is a solemn thought that when the first Sumner started practice in Liverpool, there was neither a Royal College of Veterinary Surgeons, nor a Ministry of Agriculture. I am not saying that there may be some who might think that this lack of governmental and of professional authority might be refreshing if found at the present time! Yet in those by-gone days, when there was no veterinary profession as such, no Ministry of Agriculture, and the horse was the principal economic factor, the animal kingdom generally suffered grievously from disease. Many of the former plagues in this country are now but remembered names, or else are steadily being eliminated by your Ministry and the veterinary profession working in close co-operation, through that admirable body the Animal Health Division."

The President then delighted the company with a number of pithy and jocular references to an inn sign bearing an effigy of the Minister in which he was shown, among other things, as carrying an umbrella while on horseback. Mr. Sumner continued:

"You have recalled, and it is a matter of great pride to me, that my father before me was President 30 years ago. In addition he took some part in the establishment of veterinary education within a University, at a time when this was unique, for over 50 years ago he was one of those responsible for the opening of the Liverpool Veterinary School. I, as his successor to-day, have sometimes stopped, in the few brief moments left me for thought after being both the President and a general practitioner, to marvel at the changes that are found in the world of agriculture and of veterinary medicine as between my father's day and mine. At his time as President, we were a small profession of some 3,300 members. Agriculture was depressed and even if wept for by

the Government received no material aid. Its unhappy position was reflected in the economic circumstances of our members. In the United Kingdom and Ireland there were five veterinary colleges serving the profession and the community as well as they could with their impoverished finances. Nevertheless, they were removed from the main stream of medicine and of science, and perhaps a little too complacently self-sufficient within the one portal system. What a contrast with the time of my Presidency to-day. The profession numbers some 6,000 members. The agricultural community which it serves is vigorous and growing more conscious of the need for scientific development, and is the object of some care and attention by successive Governments. Whether it has too much or too little feather bedding is a controversial subject on which I fortunately have no need to adjudicate.

" The existing colleges in the United Kingdom have been rejuvenated and to them have been added two vigorous new schools. This is undoubtedly due to the financial assistance and encouragement given by the University Grants Committee, whose Chairman, Sir Keith Murray, we are glad to have with us to-night. Yet that Committee would not have been in a position to grant this aid, had it not been fo the legislation which, in the period of the last eigh years, has so profoundly changed the face of the veterinary profession and veterinary education.

" It was recently my privilege to lead the visitors on behalf of the Royal College to one of the newest of our veterinary schools, and the report of that visitation is now before Council. I am breaking no secrets if I say that it breathes a satisfaction for what has been achieved and gives every indication of a successful fulfilment of great promise. And this promise is found equally in all the veterinary schools within the United Kingdom.

" In my lifetime there have been notable advances in both scientific development and veterinary education. The finished product of the veterinary school of to-day is the result, and is the cause of my deep and clear faith in the future of the profession. At no time in its history has the veterinary profession been more able, capable and willing to play the fullest part in the economic life of the country.

" Yet, Mr. Minister, if the economic life of our country is stressed, and it is proper that it should be stressed, let me remind you and those present to-night that the body corporate of the College embraces almost the entire world. For its members are found working in 8 Dominions, 30 Colonies, 20 Foreign countries, and in 22 of the states of the United States of America. No fewer than 18 are on the staff of the Food and Agricultural Organisation of the United Nations."

The Guests were proposed by Professor J. G. Wright, who, in his customarily felicitous phrases, indicated the scope of the careers, and the many distinctions, shared by those who were enjoying the hospitality of the Royal College that evening. To hear his speech made more than ever plain the great scope of the College's interests in these days, and the many sides of the national life upon which its work impinges.

Mr. Tom Williams, M.P., Minister of Agriculture in the post-war Socialist administration replied recalling, among other matters, the heart burnings contemporarily caused by some aspects of the Veterinary Surgeons' Act of 1948. He believed that most of the misgivings of those days had given place to broad agreement upon the Act's contribution to the life of the profession.

Towards the close of the evening the President rose to propose a special toast, not set down upon the official list. He had to announce, he said, the decision of Professor George Wooldridge not to seek re-election to the Council of the Royal College after his present term of service. Mr. Sumner then paid a most eloquent tribute to this great veterinarian, the doyen of the profession and one of its most beloved members. [In due course a presentation will be made to Professor Wooldridge, at which time it is proposed to publish a full account of his career with its outstanding contribution to veterinary science and teaching.]

To loud applause the Professor thanked the President and the company for drinking his health, a toast with which Mrs. Wooldridge was, of course, associated.

HOLIDAY EXCHANGE

In recent issues of this journal we have invited the consideration of our readers to the value of holiday and correspondence exchanges between the children of veterinary surgeons in Great Britain and those of their European colleagues. Space has precluded details of concrete suggestions for this summer, but we publish a list below. Time has now grown somewhat short, and readers who may be interested are asked to write immediately to the General Secretary of the B.V.A. who will do his very best to ensure that happy exchanges are arranged. Detailed proposals are as follows:—

Eight French *boys* ranging in age from 13 to 17 and living in the following places in France would like to be received in veterinary homes in Britain:—

Beaune, Cote-d'Or	(16-year-old)
Angoulême, Charente	(15-year-old)
Montaigu, Vendée	(14-year-old)
Montrichard, Loire-et-Cher	(17-year-old)
Allès, Gard	(17-year-old)
Mayenne, Mayenne	(14-year-old)
Champdeniers, Deux-Sèvres	(14-year-old)
Cognac, Charente	(15-year-old)

There are also 10 *girls* ranging in age from 13 to 18 from the following places:—

Meaux, Seine-et-Marne	(15-year-old)
Rheims, Marne	(18-year-old)
Garches, Seine-et-Oise	(17- and 13½-year-old)
St. Denis la Chevasse, Vendée	(18- and 16-year-old)
St. Bazeille, Lot-et-Garonne	(17-year-old)
Locmine, Morbihan	(13-year-old)
Moselle	(Two 16-year-olds)

Fuller particulars of the families concerned are available from the General Secretary and will gladly be sent on application.

News and Comment

MINISTRY OF AGRICULTURE'S LOCAL ORGANISATION

The report of the independent committee under the chairmanship of Sir Arton Wilson appointed by the Minister in December, 1954, to review the provincial and local organisation and procedures of the Ministry of Agriculture, Fisheries and Food was published on April 16th. The committee recommend important changes in the county and regional organisation of the Ministry which, they consider, will make for greater efficiency and will lead to economy in staff.

Among the main recommendations are that the veterinary service should be responsible for all technical work on the Milk and Dairies Regulations, and a new post of Regional Veterinary Officer should be created to achieve co-ordination beween the present separate Inspectorate and Investigation Service.

The Ministry's National Milk Testing Service should be disbanded and its work on routine keeping quality testing of T.T. milk undertaken by the Milk Marketing Board. The Ministry, through its C.A.E.C.s., should retain responsibility for statutory action against producers under the Milk and Dairies Regulations, but all technical work (including tests of farm samples) should be controlled by the veterinary service.

The National Agricultural Advisory Service should absorb the advisory work on estate management at present dealt with by the Agricultural Land Service, and it should shed as much non-advisory work as possible.

The Pests Services should be reorganised and reduced by combining the present eight separate groups of staff to form two services, one dealing with land pests and the other with insect pests.

The committee estimate that the implementation of their proposals could, over a period, result in savings approaching 1,000 staff costing up to £1,000,000 a year.

These recommendations represent the main views of the Wilson Committee. They involve many far-reaching changes and consequently will require careful consideration. Before reaching any decisions, the Minister proposes to seek the views of all those who would be directly affected.

R.A.V.C. DIVISION OF THE B.V.A.

Arrangements have been made for the next meeting of the R.A.V.C. Division of the B.V.A., to be held at the Agricultural Research Council Field Station, Compton, Nr. Newbury, Berks., on Wednesday, May 9th, 1956, at 11 a.m. A conducted tour of the Research Station is included on the agenda. All members of the profession are welcome.

It is requested that those who propose to attend notify the Hon. Secretary of the Division, Lieut.-Col. E. H. Lewis-Bowen, The War Office, Droitwich, Worcs, before May 5th, 1956, notifying whether they require lunch or tea, or both, in order that the catering arrangements may be carried out.

THE STEELE-BODGER MEMORIAL PRIZE

This Prize was created by the fund established in 1953 to perpetuate the memory of the late Harry Steele-Bodger. It takes the form of a travelling scholarship, or a contribution to a tour abroad, and is to be awarded at least once in every four years.

Members of the Royal College of Veterinary Surgeons are eligible; together with final year students of any of the university veterinary schools in the United Kingdom and Eire.

Further particulars may be obtained from the General Secretary of the B.V.A.

UNIVERSITY NEWS

London

Part 1, Veterinary Clinical Examination, March, 1956

Baldwin, Basil Arthur; Bowen, John Meirion; Churchill, Anthony Edward; Davidson, William Roy; Dyson, Peter Travis; Edney, Andrew Thomas Bailey; Embleton, Gerald Anthony; Ezebuiro, Emmanuel Ogoegbulam; Fisher, Betty Margaret; Gray, Douglas Francis; Griffin, Richard Michael; Harries, Benjamin Llewelyn; Jackson, Faith; Jones, Willie David; Knowles, Robert Thomas; Mann, Peter George Hubert; Martin, Charles Anthony Wyndham; Millett, John Douglas; Randlesome, Anthony George Charles; Rodgers, Samuel Edgar; Rutty, Donald Arthur; Southerton, Anthony George; Sykes, Kenneth Chadwick; Taylor, John Michael; Thornton, David Alexander Kennedy; Turner, William Trevor, and Weetman, Peter Albert.

PERSONAL

Births

CAMPBELL.—On April 7th, 1956, at Keighley Victoria Hospital, P.M.U., to Betty, wife of Donald Campbell, M.R.C.V.S., of Lydstep, Oakworth, Keighley, Yorkshire, a son.

MACDONALD.—On March 26th, 1956, to Norma, wife of David K. Macdonald, M.R.C.V.S., of "Penrhyn," Barrow, Suffolk, a daughter, Catriona Mary, sister for Angus.

ROBERTS.—On March 27th, 1956, to Bessie, wife of L. W. Roberts, M.R.C.V.S., of 20, Cardiff Street, Aberdare, Glamorgan, a daughter, Janet Anne, sister to Stephen.

SINCLAIR.—On March 30th, 1956, to Hazel, wife of K. B. Sinclair, M.V.SC., M.R.C.V.S., of Aberystwyth, a daughter.

WATKINS.—On April 13th, 1956, to Marianne, wife of Idris M. Watkins, B.V.SC., M.R.C.V.S., of Brynhyfryd, Llanyre, Llandrindod Wells, a son, John Idris, brother for Sian Elizabeth.

Marriages

BOWMAN—HART.—At St. Matthew, Moorfields, Bristol, on March 24th, 1956, John G. W. Bowman, B.SC., M.R.C.V.S., of South Shields and Redditch, to Brenda Hart of Bristol.

RICHARDS—PAIN.—At St. Mary's Church, Old Alresford, Hants, on April 14th, 1956, Michael Anthony Richards, M.R.C.V.S., of Winchester, to Sylvia Rosemary Pain, Pinglestone Farm, Old Alresford, Hants.

MR. F. J. F. BARRINGTON

The death of this eminent surgeon occurred on March 23rd. A correspondent writes:—

Mr. F. J. F. Barrington, affectionately known as "Snorker" to students and colleagues at University College Hospital, was a man of notable talent and possessed of a wide circle of friends. An outstanding genito-urinary surgeon, he was a leading authority on the physiology of micturition, his published work on the latter having been described as classical. He was in addition a keen biologist, with an excellent knowledge of birds and of wild flowers, and the combination of his interests led him to study the comparative anatomy and physiology of the genito-urinary system of many different species. He was a regular attendant at the monthly scientific meetings of the Zoological Society of London and at the Zoo Club dinners and discussions that followed.

It would be difficult to write of Barrington without reference to his geniality as a host and his kindness to all who sought his help. Equally as friend and scholar he will be sorely missed.

COMING EVENTS

April

26th (Thurs.). Meeting of the Essex Division, B.V.A., at the Essex Institute of Agriculture, Writtle, Essex, at 7.30 p.m.

May

2nd (Wed.). Meeting of the Southern Counties Division, B.V.A., in the Polygon Hotel, Southampton, 7 p.m.

3rd (Thurs.). Annual General Meeting of the Central Division, B.V.A., at the Royal Veterinary College, Camden Town, N.W.1, 6 p.m.

4th (Fri.). Annual Ball of the Royal Veterinary College Students' Union Society at the Criterion Restaurant, 9 p.m.

Fifth Annual General Meeting of the Society for the Study of Animal Breeding at the Agricultural Research Council Field Station, Compton, 11.30 a.m.

General Meeting of the Lincolnshire and District Division, B.V.A., at the Saracen's Head Hotel, Lincoln, 2.15 p.m.

Annual Dinner and Dance of the Chiron Club in the Royal Hotel, Bristol, 7 p.m.

5th (Sat.). Annual General Meeting of the Association of State Veterinary Officers in the auditorium of the Wellcome Research Institution, 183-193, Euston Road, N.W.1, 4 p.m.

9th (Wed.). Meeting of the R.A.V.C. Division of the B.V.A. at the Agricultural Research Council Field Station, Compton, Nr. Newbury, Berks, 11 a.m.

10th (Thurs.). General Meeting of the Society of Women Veterinary Surgeons in the Veterinary School of the University of Cambridge, 11.30 a.m.

16th (Wed.). Annual General Meeting of the Scottish Regional Group of the A.V.T. and R.W's. in the University of Glasgow Veterinary Hospital, Bearsden Road, Bearsden, 2.15 p.m.

September

16th to 22nd (Sun. to Sat.). 74th B.V.A. Annual Congress at Royal Leamington Spa.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Denbigh. Plas Matw, Llangernyn, Abergele (Apr. 10).

Derby. Moor Lane, Bonsall, Matlock (Apr. 11); 59, West End, Pinxton (Apr. 13).

Lancs. Rose Farm, Deansgate Lane, Formby, Liverpool (Apr. 12).

Leics. Dob Hall Farm, Little Stretton (Apr. 10); Home Farm, Drayton, Market Harborough (Apr. 11); Willow Farm, Queniborough (Apr. 12); Carlton Lodge, Gaddesby (Apr. 13).

Lincs. Willow Lodge, Burgh le Marsh, Skegness Apr. 12).

Montgomery. 30, Mill Place, Welshpool (Apr. 11).

Norfolk. Vale Farm, Wareham, Stiffkey (Apr. 11).

Northants. Pumping Station Meadow, Barnwell, Oundle, Peterborough; Grove Field, Bell Hill Farm, Finedon, Wellingborough (Apr. 12).

Perth. Keithick Mains, Coupar Angus (Apr. 16).

Staffs. Haughton Farm, Haughton, Stafford (Apr. 12).

Suffolk. Park Farm, Wrentham, Beccles (Apr. 13).

West Lothian. Torbanehill Farm, Whitburn (Apr. 12).

Yorks. Poplar Farm, Long Sandall, Doncaster; Crow Trees Farm, Crosby, Northallerton (Apr. 11); Manor Farm, Whenby, Bransby; Piggery, Wetmoor Lane, West Melton, Rotherham; Manor Farm, Sneaton, Whitby (Apr. 11); Low Well Farm, Wheldrake (Apr. 16).

Fowl Pest

Ches. Newton Dairy Farm, Hoole, Chester (Apr. 12).

Essex. Carrig Poultry Farm, Hutton, Brentwood (Apr. 10); Hazlemere, North Drive, Hutton, Brentwood (Apr. 11); Bersheda, Arterial Road, North Benfleet (Apr. 14).

Hants. Rossmoor, Winchester Road, Fair Oak, Eastleigh (Apr. 11); 44, Kinson Road, Wallisdown, Bournemouth.

Kent. Green Farm, West Kingsdown, Sevenoaks (Apr. 11); Park Corner, Knockholt, Sevenoaks (Apr. 14).

Lancs. Plot 15, Dorothy Street Allotments, St. Helens (Apr. 10); Mushroom Field, St. Helens (Apr. 13).

Swine Fever

Bucks. Home Farm, Northall, Edlesborough, Dunstable (Apr. 13).

Cambs. Piggeries, Sandy Lane, Wisbech (Apr. 13).

Dorset. Manor Farm, Eype, Bridport (Apr. 13).

Essex. Post Office, Berden, Bishop Stortford; Copt Hall Farm, Thaxted, Dunmow (Apr. 10); The Bungalow, Warwick Corner, White Roding, Dunmow (Apr. 11).

Hants. Court Wood Pig Farm, Damerham, Fordingbridge (Apr. 12); The Dell, Valley Road, Strouden Park, Bournemouth (Apr. 17).

Kent. "Woodstock," Hawkinge, Folkestone (Apr. 13).

Lancs. Carr House, Windy Arbour Road, Whiston, Prescot (Apr. 14); Keepers Cottage, Pool Hey Lane, Scarisbrick, Ormskirk (Apr. 16); Bradkirk Farm, Wrea Green, Preston (Apr. 17).

Lincs. Brook Cottage, Middle Rasen; Springfield, Tetney, Grimsby (Apr. 16).

Staffs. Bradley Elms, Threapwood, Cheadle, Stoke-on-Trent (Apr. 11); Green Gables Farm, Threapwood, Cheadle, Stoke-on-Trent (Apr. 17).

Norfolk. Redgate Farm, Thetford (Apr. 16).

Suffolk. Lodge Farm, Little Saxham, Bury St. Edmunds (Apr. 10).

Sussex. Oldfields Farm, West Chiltington Road, Storrington (Apr. 17).

Warwicks. 50-60, Austry Road, Warton, Tamworth (Apr. 11).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

Wounds in the Teats of Cows

Sir,—Mr. Bell's letter regarding the slow healing of cows' teats rather surprised us as we have always found teat tears fairly quick to heal. Our experience of wounds extending to the teat canal is limited to some half-dozen cases, but as yet we have not had one breakdown as described by Mr. Bell.

Our cases were all in cows newly calved or in full milk. With one exception, the procedure followed has been the same. Using a fine needle, the area surrounding the wound was infiltrated with a local anaesthetic; Xylotox being used for the first three cases, Ravocaine for the others.

The edges of the wound were freshened by scraping and cutting away obviously damaged tissue, and the wound sutured with deep, and superficial mattress sutures, using single strand nylon.

Each cow received 10 c.c. of Distaquaine intramuscularly and 100,000 units of intramammary penicillin at this time.

Milking by teat syphon was instituted, particular stress being laid on the need for aseptic precautions, and as a further safeguard 50,000 units of intramammary penicillin were introduced into the teat after each milking. The sutures were removed 9 or 10 days later.

Two cases merit individual mention. The first concerns a four-year-old Shorthorn which suffered a Y-shaped tear involving the whole length of the teat and extending around its base, so that the teat was hanging by only about a third of its circumference. Bearing in mind the paucity of the blood supply due to such extensive damage, a poor prognosis was given, but much to our surprise healing was rapid and uncomplicated.

The second case was that of a particularly fractious, newly calved Ayrshire which required to be cast before suturing could be accomplished. The procedure for closing the wound, which had penetrated the teat duct for its whole length, was as described above, but the woman owner, who was afraid of handling the teat with the cow in its present mood, declined to attempt milking by any method, and the animal received no further treatment except 10 c.c. of Distaquaine two days later. The quarter was left unmilked for eight days, until the sutures were removed. Healing was again uncomplicated and when the quarter was eventually milked there was no indication of mastitis.

We found this case interesting, because it indicates the possibility of suturing a teat, leaving it alone, and still getting good results. Much as we dislike using tubes in cows' teats, we have yet lacked the courage to dispense with them as routine, and would be interested to hear from any practitioner who does so.

Mr. Bell does not say if he always uses catgut for closing the duct in penetrating teat wounds, for here might be the reason for the breakdown. The foreign-body reaction on the part of the tissue, due to its presence, might, we think, prevent first intention healing.

Yours faithfully,

JOHN P. CAVILL.

"Plastirion,"
Bangor, Caernarvonshire.

April 10th, 1956

Sir,—I would like to comment on the views expressed by Mr. Bell. I also have found that teat tissue has very poor granulating capacity when stitched, and in order to ensure satisfactory healing have always covered the stitched teat with elastoplast, cut to the appropriate size and wound round three or four times. When the wound is not too gaping I have even omitted stitching and have had a high degree of success with this method. My procedure is to insert a teat bougie, usually a warm one impregnated with a sulphonilamide, clean the teat with methylated spirit to remove all grease and clotted blood, sprinkle sulphonilamide powder on the wound and then apply the elastoplast. If the plaster is not too thick the teat cups fit quite comfortably for milking, and the plaster bandage will often stay on for 7 to 8 days or longer. The cowman can then renew the dressing. It is advisable to keep the teat covered for at least 14 days. The elastoplast method was first suggested to me by Mr. Gold of Redditch and has proved highly effective even in very bad injuries.

Yours faithfully,

M. SACHS.

647, Scott Hall Road,
Leeds, 17.

April 6th, 1956.